

Bengal may be ruled out due to the opposite direction of water currents.

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20. OCCURRENCE OF CONGENITAL BLINDNESS IN GHARIAL *GAVIALIS GANGETICUS* (REPTILIA: CROCODILIA)

INTRODUCTION

During 1975 out of 70 eggs of gharial *Gavialis gangeticus* incubated at the Gharial Research and Conservation Unit, Tikerpada, two hatchlings were blind (Subba Rao and Bustard 1979). During 1976, 60 eggs were incubated at Katerniyaghat, which produced one blind gharial (Singh and Tandan 1978). Again at Tikerpada, during 1976 three blind gharials were produced from 140 eggs (Singh and Bustard 1982a). All these instances relate to eggs which originated from Gangetic rivers of Kamali-Girwa and Kali-Narayani-Gandak in Nepal or in India, along the Indo-Nepal border. This feature had then led us to suggest the possible presence of a deleterious 'blind' gene in the populations of gharial in these rivers.

Here we present information recorded after the hatching of a blind gharial in captivity at Nandankanan Biological Park, Orissa. We also discuss the general frequency of occurrence of blindness reported for the species hitherto. Retarded growth in blind gharial, as observed by Singh and Bustard (1982b) has also been observed at Nandankanan.

RESULTS

Captive gharials at Nandankanan bred for the first time during 1980. There were two females, Juli and Mili, both procured from river Mahanadi during 1963 and 1964. The male, with an uncertain origin, was received from the Frankfurt Zoo in 1979.

On 20 March 1982, Mili laid 28 eggs. 12 were left for incubation *in situ* and 16 were shifted for hatchery-incubation. In the breeding pen six young ones hatched on 29 May 1982. These included one blind hatchling. All six, along with eight others hatched in the hatchery on 2 June, were shifted to hatchling pools for rearing under identical

husbandry conditions.

The blind gharial did not have any trace of the eye and fitted the description and photograph given by Singh and Bustard (1982a). On 10 August 1988 the blind gharial died when its SV length was 59 cm, total body length 120 cm and body weight 4.800 kg.

DISCUSSION

Frequency of blindness: The frequency of occurrence of blindness in gharial as per the published information (Singh and Tandan 1978, Subba Rao and Bustard 1979, Singh and Bustard 1982a) and the present observation are 1.67% at Girwa (Katerniyaghat), 2.86% and 2.14% at Tikerpada, 0.42% at Chitwan and 3.57% at Nandankanan. Only the last record is from captive breeding while the others are from eggs collected from the wild. The mean frequency is $2.1\% \pm 1.2\%$ of the total eggs incubated.

Though the origin of the male which participated in captive breeding at Nandankanan is not known, its origin from the Gangetic system along Nepal/India terai cannot be ruled out. If such an origin is correct then the possible presence of a deleterious 'blind' gene in the concerned region can gain further ground. If the origin is from somewhere else, then either the male or the female could have been responsible for the blindness. Since no further blindness in gharial have been recorded from any of the places mentioned earlier, it is argued that 'blindness' is one of the 12 congenital defects recorded for the species by Singh and Bustard (1982a) and can occur at any time like any other defect. However, it is an observed fact that blind gharials need to be helped out of the egg and the whole process of captive management and gharial conservation had received greater attention and care during the period from which all published reports have come. Therefore, the possibility of 'having missed to help a blind gharial

out of the egg' cannot be ruled out. In such a case, the frequency of occurrence of blindness can be accepted as 2.1% of the eggs incubated.

Retarded growth: Singh and Bustard (1982b) recorded 186 cm and 15.4 kg for the blind gharial five years after hatching, against 278 cm and 71.8 kg for normal gharial captive reared under identical conditions at Tikerpada. In the present study we recorded 120 cm and 4.8 kg nearly 6.5 years after hatching for the blind gharial at Nandankanan. These data indicate that blind gharials are not

only difficult to hatch alive but also do not grow at normal rates.

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21. CANNIBALISM IN THE STAR TORTOISE *GEOCHELONE ELEGANS*

Tortoises in general are herbivorous, though there are odd records of their picking up animal material. Whitaker (*JBNHS* 71(1): 147-148) reports a star tortoise *Geochelone elegans* feeding on a dead mouse. Das (*INDIAN TURTLES: A FIELD GUIDE*, 1985) has mentioned that star tortoises sometimes eat snails, bird droppings and carrion.

From 1960 to 1975, I used to keep large numbers of star tortoises of different sizes for export. In 1969 it was observed that one male, believed to be about 15 years of age, was very vicious and attacked others. One day a small, three to four year old tortoise was found dead with its head

eaten. On each of the following two days, one more tortoise was found dead. All three tortoises had lost only their heads. Shrews sometimes kill tortoises, and on the fourth day a careful watch was kept. It was observed that the old male attacked the smaller tortoises (all 3-5 years old). In all four cases only the head was eaten; the legs were retracted and uninjured.

Cannibalism in turtles and tortoises is apparently rare. In the predominantly herbivorous tortoises this phenomenon is especially interesting.

October 15, 1990

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22. THE FRESHWATER TURTLE FAUNA OF EASTERN RAJASTHAN

(With a text-figure)

The present paper describes the freshwater turtle fauna of eastern Rajasthan, particularly of the rivers Banganga and Gambir, the water source for the Keoladeo National Park.

METHODOLOGY

The Banganga and Gambir river systems extend from the north of Jaipur in the west to the north-east of Dholpur in the east. Both rivers are non-perennial. The Keoladeo National Park which lies in their flood plain receives water from them during the rainy season.

The pools along the course of the rivers, associated reservoirs, and nearby village ponds were surveyed for

turtles. Fish nets were used to collect turtles, and turtles were also caught by hand from shallow water. Wetland areas which had gone dry were also surveyed and shells collected.

The nomenclature followed is that of Iverson (1986). Most of the survey sites were covered during the dry season from May to July 1989. The Keoladeo National Park was surveyed from January 1988 to December 1988.

RESULTS AND DISCUSSION

A total of 25 water areas were surveyed (Fig. 1), which include 5 sites in Banganga, 17 in Gambir and 2 in